



Improving Child Health Through Nutrition:

THE NUTRITION MINIMUM PACKAGE

Executive Summary

According to current estimates, about 70 percent of all childhood mortality in developing countries is due to five major conditions: diarrheal diseases, acute lower respiratory tract infections (ARI), malaria, measles, and malnutrition. There is a great deal of evidence that malnutrition, even in its milder forms, can increase the likelihood of mortality from a number of different diseases and may be associated with over half of all childhood mortality. This makes malnutrition one of the most important public health problems in developing countries. To have a sustained impact on childhood morbidity and mortality, health programs must include interventions to reduce malnutrition.

Many organizations and governments have supported the integration of nutrition into health programs, but progress has been slow in making nutrition a routine component of primary health care. Changing the behaviors of caretakers and families is critical to reducing malnutrition and other childhood illnesses. There is now a large body of epidemiological and programmatic data available to help determine the most important nutrition behaviors and the effectiveness of programs to change these behaviors. These data have been reviewed and then discussed with leading authorities in public health nutrition. This paper presents the six primary behaviors selected on the basis of such criteria as demonstrated relationship with morbidity and mortality, ability to be changed through cost-effective public health programs, and measurability. Interventions that

target these six behaviors have been called the Minimum Package of nutrition interventions. They should be an integral part of all primary health care programs. The Minimum Package interventions aim to achieve these health and nutrition behaviors:

- Exclusive breastfeeding for about 6 months;
- Appropriate complementary feeding starting at about 6 months in addition to breastfeeding until 24 months;
- Adequate vitamin A intake for women, infants, and young children;
- Appropriate nutritional management during and after illness;
- Iron/folate tablets taken by all pregnant women; and
- Regular use of iodized salt by all families.

In order for nutrition interventions to be integrated with maternal and child health activities, they need to be adapted to local circumstances and incorporated into primary health care activities at the household, community, and health facility levels. In addition, nutrition interventions must be monitored and evaluated regularly to determine progress toward goals and to allow strategies to be modified and improved. There is widespread agreement regarding the urgency of moving ahead with the Minimum Package. This paper describes the main steps required to initiate action.

Abstract

Progress has been slow in making nutrition a routine component of primary health care programs. The improvement of child feeding practices and prevention of malnutrition must begin in the home. Changing the behaviors of caretakers and families is critical to reducing malnutrition and other childhood illnesses. Health facilities and health workers can play an important supportive role.

The interventions that target the six most important nutrition behaviors have been called the Minimum Package of nutrition interventions, and these should be implemented by all primary health care programs. The Minimum Package interventions aim to achieve these health and nutrition behaviors: exclusive breastfeeding for about 6 months; appropriate complementary feeding starting at about 6 months in addition to breastfeeding until 24 months; adequate vitamin A intake for women, infants, and young children; appropriate nutritional management during and after illness; iron/folate tablets taken by all pregnant women; and regular use of iodized salt by all families. There is widespread agreement regarding the urgency of moving ahead with the Minimum Package. Programs need to adapt nutritional interventions to local circumstances and incorporate them into primary health care activities at the household, community, and health facility levels.

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Improving Child Health Through Nutrition:

THE NUTRITION MINIMUM PACKAGE

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The importance of nutrition in developing countries

According to current estimates, about 70 percent of all childhood mortality in developing countries is due to five major conditions: diarrheal diseases, acute lower respiratory tract infections (ARI), malaria, measles, and malnutrition (figure 1). Evidence shows that malnutrition, even in its milder forms, can increase the likelihood of mortality from a number of different disease entities and may be associated with up to 56 percent of all childhood mortality (Pelletier, Frongillo, and Habicht 1993; Pelletier et al. 1995). This makes malnutrition one of the most important public health problems in developing countries. To have a sustained impact on childhood morbidity and mortality, health programs must include interventions to reduce malnutrition.

Focusing on selected nutrition behaviors to improve child health

In developing countries, the practices of caretakers and families in the home and community are critical to preventing infant and child morbidity and mortality (Waldman et al. 1996). Caretakers often do not practice behaviors that will prevent infant and childhood health problems before they arise. Children may not be treated properly when they become sick because many families do not have access to health facilities, or, even if they do, do not seek care regularly. To prevent malnutrition, caretakers must practice effective feeding practices using appropriate foods and, when necessary, they must seek care from health care providers. To change the nutritional status of populations, therefore, it is critical to change the behavior of caretakers, families, and communities. When care is sought at health facilities, health workers play an important role in providing essential services. They need to be trained to provide appropriate nutritional management and counseling for both sick and well children.

There are four important considerations in selecting the most important health and nutrition behaviors of caretakers in the home and designing approaches to change these behaviors.

- **Impact on morbidity and mortality.**

Epidemiological data from a number of developing country settings have allowed us to identify those caretaker behaviors that are likely to play an important role in preventing or treating malnutrition and the impact of changing these behaviors on childhood illness.

- **Feasibility.** Some behaviors have proved difficult to change; others can be changed in the short term but cannot be sustained.

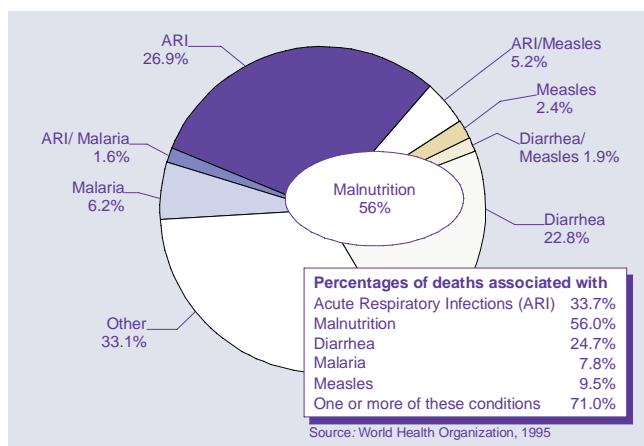


Figure 1. Distribution of 12.2 million deaths among children less than 5 years old in all developing countries, 1993

Similarly, some interventions and approaches are easier to implement than others. Programmatic experience from a number of settings allows us to identify those interventions and behaviors that may be easier to address than others.

- *Cost-effectiveness.* Programs do not have unlimited resources, so they must endeavor to maximize the impact of every dollar spent.
- *Measurability.* In order to monitor and evaluate programs, interventions and behaviors should be measurable using simple indicators.

These considerations were used to select the key behaviors and interventions. Epidemiological and programmatic data were reviewed and discussed with leading authorities in public health nutrition. Evidence of the efficacy and effectiveness of the selected interventions is summarized in the next section. Measurement issues are discussed in the last section. More information was available for some interventions than for others; in general, adequate data on cost-effectiveness for most interventions were lacking.

Nutrition interventions are those program strategies and actions that are required to change behaviors in the household and community. Those interventions that target the six primary nutrition behaviors have been called the Minimum Package of nutrition interventions and are the core actions that should be implemented by all primary health care programs. Other nutrition behaviors and interventions, such as iron supplementation for young children, improved maternal diets during pregnancy, zinc supplementation, wheat fortification, and deworming, were reviewed for inclusion in the Minimum Package. These were not included either because of limited information on their efficacy in reducing infant and child morbidity and mortality universally, or because of limited data on feasibility and cost-effectiveness in most program settings. Other program activities such as growth monitoring and integrated management of childhood illness (IMCI) are considered delivery mechanisms that can be used to implement one or more of the Minimum Package interventions.

The six behaviors that are the focus of Minimum Package interventions and examples of interventions/strategies used to implement them are summarized in figure 2.

Technical justification for the Minimum Package

The interventions in the Minimum Package are not new. Evidence of positive impact that has accumulated over the past two to three decades has led to a global commitment to implement them. These interventions are included in the World Summit for Children goals, International Conference of Nutrition (ICN) targets, and ICN follow-up activities by countries developing their own action plans. They have been demonstrated to be among the most cost-effective in reducing the global burden of disease (Horton et al. 1996; Jamison et al. 1993; Sanghvi 1993; World Bank 1993). For example, as shown in figure 3, breastfeeding and vitamin A supplementation cost less per disability adjusted life year (DALY) gained than almost any other intervention (they appear close to the uppermost sloping line) and are low cost and therefore more affordable (they fall on the extreme right-hand side of the graph).

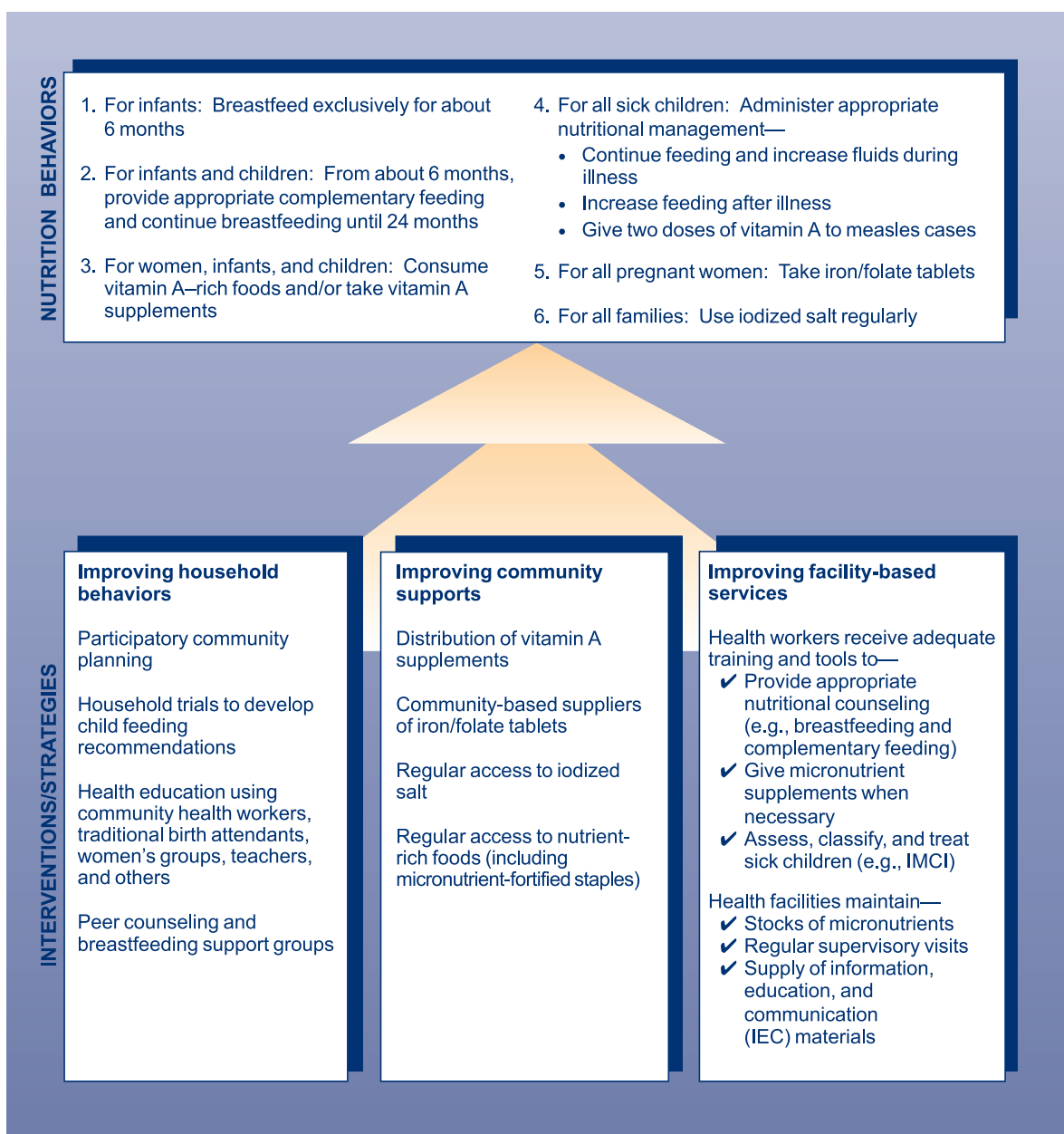


Figure 2.
The nutrition
Minimum
Package

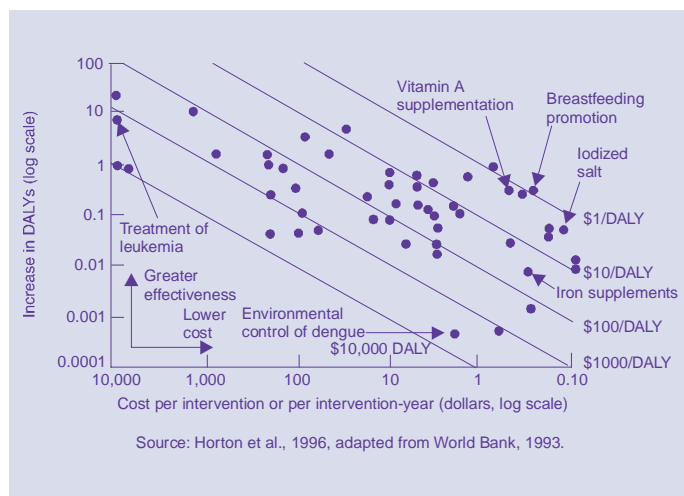
The technical data on impact and feasibility, used to select the six Minimum Package behaviors and the interventions to target these behaviors, are summarized below.

1. Exclusive breastfeeding for about six months

Relative to infants who are exclusively breastfed (defined as an infant who is given no liquid or solid other than breast milk), infants not breastfed at all have at least 14 times the risk of death due to diarrhea (Feachem and Koblinsky 1984; Victora et al. 1989).¹ The risk is greatest in the first two months of life. Data from Brazil (Victora et al. 1987), Peru (Brown et al. 1989), and the Philippines (Popkin et al. 1990) show that premature supplementation of breastfeeding is associated with greater risk of diarrheal morbidity and death. Even the introduction of herbal teas and water to exclusively breastfed infants increases the risk of diarrheal morbidity and death. Risk of death from respiratory disease is four times greater and, for other infections, two and a half times greater for nonbreastfed infants than for exclusively breastfed infants.

Exclusive breastfeeding provides immunological protection for infants, provides a source of energy and nutri-

Figure 3.
Benefits and
costs of nutrition
and health inter-
ventions



ents, and prevents contamination from other fluid sources. Fertility suppression through frequent, unsupplemented breastfeeding has important maternal and child mortality implications as well (Kennedy, Rivera, and McNeilly 1989).

Introduction of other foods and fluids frequently results in decreased breast milk consumption, thereby decreasing infant nutritional intake; complementary foods decrease the absorption of iron contained in breast milk. Foods most commonly

¹ There is recent evidence that postnatal transmission of HIV-1 can occur through breastfeeding. HIV-1 has been detected in human breast milk by viral culture, and mother-child transmission of HIV-1 has been documented in breastfeeding women who acquired HIV after delivery (Palasanthiran et al. 1993; Van de Perre et al. 1991; Ziegler et al. 1985). A metaanalysis of several studies has demonstrated the risk of transmission through breastfeeding to be 14 percent for children born to mothers who were seropositive before delivery and 29 percent for children born to mothers infected postnatally (Dunn et al. 1992). On the basis of more recent data from the Ivory Coast, it is estimated that late postnatal transmission of HIV-1 (transmission occurring after 6 months of age) occurred in 12 percent of children born to HIV-1 seropositive mothers and 6 percent of children born to mothers seropositive for both HIV-1 and HIV-2 (Ekpini et al. 1997). Decisions about breastfeeding policy must weigh the risks of infection and death from HIV-1 with the risk of death from other common causes of infant and child mortality (Kuhn and Stein 1997; Zimmer and Garza 1997). The current UNAIDS guidelines emphasize that breastfeeding should continue to be promoted in all countries because of its important role in child survival and maternal health (UNAIDS 1996). This policy statement emphasizes the importance of improving access to HIV counseling and testing and of ensuring that all mothers make an informed choice about breastfeeding their infants without commercial pressure to adopt artificial feeding. These guidelines are likely to be revised as more data become available.

used for infant feeding in low-income households rarely compensate for the nutrients in the displaced breast milk. Health workers need to be careful to counsel mothers not to introduce supplements prematurely and to maintain a high, 24-hour frequency of breastfeeding to ensure milk supply and fertility suppression (Brown, Allen, and Dewey 1995; UNICEF/WHO 1989).

Programmatic evaluation data suggest that breastfeeding practices can be improved in a number of populations and that improving exclusive breastfeeding practices can reduce infant morbidity and mortality, particularly from diarrhea. Mothers of young infants need to minimize separation from their infants, have access to good quality counseling for breastfeeding, and receive encouragement and support from families and health providers (Burkhalter and Marin 1991; Horton et al. 1996; Lutter et al. 1997; Mata et al. 1983; Sanghvi 1995; Winikoff and Baer 1980).

2. Appropriate complementary feeding from about 6 months in addition to breastfeeding until 24 months

Breast milk alone does not usually provide all nutrients needed by an infant over 6 months of age (IDECG 1996). By 6 months, infants are more likely to be developmentally ready to consume a variety of foods. Caretakers are also more likely to accept the feeding of nutritionally adequate semisolid foods to infants of that age. In addition, the infant's gastrointestinal tract is mature enough to digest such foods and the immune system is developed enough to respond to environmental pathogens.

Traditional feeding practices can be improved by modifying the composition, frequency, and quantity of food given to infants and young children. Even when the quality of the foods given is adequate, children may not receive enough calories and nutrients because feeding practices are poor. For example, it is important to counsel mothers that children receive age-appropriate quantities of food and numbers of feedings and that they are actively encouraged to feed at appropriate times. For complementary foods to be appropriate in energy and nutritional value, most staple foods (wheat, millet, corn, rice, cassava) need to be enriched. Ingredients with high nutrient-to-energy and energy-to-volume values can often be found in local environments.

Reducing the water content and introducing animal foods, fats, oilseeds, nuts, legumes, and varied fruits and vegetables to the staple diet can improve nutritional density (Brown, Allen, and Dewey 1995; Steel 1996).

Continuing breastfeeding, in addition to appropriate complementary feeding until 24 months of age, is important to prevent nutritional deficiencies because breast milk accounts for a substantial proportion of fat, vitamin A, calcium, and high-quality protein (Brown, Allen, and Dewey 1995). Breastfed children are 65 to 90 percent less likely to develop vitamin A deficiency signs (Sommer and West 1996). There are limited data available demonstrating the sustained, large-scale program effectiveness of complementary feeding interventions (Griffiths 1991; Klemm et al. 1997; Manoff International 1983; USAID 1988; Wollinka et al. 1997).

3. Adequate vitamin A intake for all women, infants, and young children

In populations where vitamin A deficiency is endemic, a 23–34 percent reduction in mortality is expected when vitamin A status is improved. Community trials with children 6 to 71 months of age achieved this impact using universal, periodic supplementation in the form of single megadoses every three to four months, small weekly doses, or regular use of vitamin A–fortified foods. The megadoses consisted of 100,000 international units (IU) at 6–11 months of age, 200,000 IU at 12 months of age or older, and a single 200,000 IU dose for postpartum mothers. Recent evidence suggests that a single oral dose (200,000 IU) of vitamin A given to women shortly after delivery results in a significant improvement in vitamin A status and a reduction in infant morbidity (Roy et al. 1997; Stoltzfus et al. 1993). Weekly doses (25,000 IU) used in field trials with children equaled recommended daily allowances (RDAs) and could be obtained from food sources. The observed mortality reduction was due in large part to a fall in diarrhea- and measles-related deaths in the supplemented children (Beaton et al. 1993; Muhilal et al. 1988; Rahmathullah et al. 1990; Sommer et al. 1986). A range of program approaches has been used to improve the vitamin A status of women and children. Preformed vitamin A in animal foods and beta carotene in plant foods have been shown to improve vitamin A status (de Pee et al. 1997; Sommer and West 1996). Intake of vitamin A–rich foods has been successfully increased through nutrition education programs in Thailand (Smitasri et al. 1994), Bangladesh (HKI/B 1996, 1997), and Niger (AED 1996). Coverage rates of 80 percent to over 90 percent with vitamin A capsules have been reported in national and regional programs in the Philippines, Bangladesh, Nepal, Vietnam, and Brazil (HKI/N 1996, 1997; UNICEF 1995a). Food fortification has been successful in improving vitamin A status in developed and developing countries (Arroyave et al. 1979; Muhilal et al. 1988; Nestel 1993).

4. Appropriate nutritional management of sick infants and children

Infants and children need specific nutritional care when sick to recuperate and prevent increased risk of mortality.

Continued feeding and more fluids for sick children and increased feeding after illness

Continued feeding and increased intake of fluids during illness is important to prevent weight loss. Feeding after illness with more frequent and larger amounts of nutrient-dense foods over a sustained period of time is also required to regain lost nutrients and energy. A number of studies suggest that diarrheal illness in childhood contributes to secondary malnutrition and that this effect is more severe in malnourished children. Both continued feeding during the illness and increased feeding during the convalescent phase are important in reducing this negative outcome (Black, Brown, and Becker 1984; Brown 1994; Brown et al. 1988; Martorell et al. 1975, 1980; Whitehead 1977). Continued breastfeeding during diarrhea shortens duration and reduces the risks of dehydration and growth faltering due to diarrhea (Huffman and Combest 1990). Nonbreastfed children are about three times more likely to develop moderate or severe dehydration during a diarrhea episode than children who are breastfed

(Victora et al. 1992). Frequent breastfeeding reduces the need for oral rehydration salts (ORS), provides a clean fluid with low solute load, and is more acceptable to sick infants. Continued feeding maintains the activity of intestinal digestive enzymes during illness, promoting nutrient absorption; this, in turn, prevents nutritional deterioration and, possibly, lack of appetite (Bentley 1988, 1992; Bentley et al. 1991; Bhuiya and Streatfield 1995). Diarrheal disease control programs in Asia have successfully increased breastfeeding duration through counseling mothers who brought their children for diarrhea treatment (Haider et al. 1996). In general, it has proved difficult to change the feeding patterns of children both during and after illness because of a number of factors, including cultural perceptions of illness, local feeding practices, and poor appetite in sick children.

Distribution of two doses of vitamin A for measles case management

Clinical trials of children hospitalized with measles have demonstrated that two high doses of vitamin A reduced mortality, with case-fatality ratios reduced on average by 66 percent (Coutsoudis, Broughton, and Coovadia 1991; Hussey and Klein 1990). The recommended protocol is one dose on diagnosis of measles and one on the next day at the following levels: below 6 months of age, 50,000 IU per dose; 6–11 months of age, 100,000 IU per dose; 12 months of age and older, 200,000 IU per dose.

5. Iron/folate tablets taken by all pregnant women

Iron deficiency anemia is the world's most common nutritional deficiency. It affects pregnant and lactating women and children under 3 years of age most commonly (WHO 1991). Anemia in mothers predisposes to stillbirths, neonatal mortality, and anemia and low birth weight in infants and increases the risk of maternal mortality (Walsh et al. 1993). Anemic mothers are also less likely to implement routine child care tasks or engage in activity requiring energy expenditure because of the debilitating effects of iron deficiency on aerobic capacity and productivity (Scholz et al. 1997; Stoltzfus 1994). Regular administration of ferrous sulphate prevents anemia during pregnancy. Daily supplementation with ferrous sulphate tablets (including folic acid) at a level of 60 to 120 milligrams of elemental iron per day for the last two trimesters (in combination with deworming if necessary) is a low-cost, effective intervention (Levin et al. 1993; McGuire and Galloway 1994; Stoltzfus and Dreyfuss 1997). Health authorities need to ensure adequate supplies and quality of tablets, counsel for side effects, and provide reminders for daily compliance through information, education, and communication (IEC). Programs with demonstrated high coverage are being implemented in Indonesia, Bolivia, and Guatemala as part of safe motherhood programs (Galloway 1997). The Indonesian program evaluation showed that by providing iron/folate tablets through community-based distributors and by improving counseling (how and when to take tablets, etc.), coverage of and compliance with iron supplementation could be improved significantly. Achieving an adequate and reliable supply of iron/folate tablets has been a frequent constraint to program effectiveness.

6. Regular use of iodized salt by all families

Iodine deficiency is the world's greatest single cause of brain damage and mental retardation. Its impact on mortality is substantial (Burkhalter 1993; Clugston et al. 1987; Cobra et al. 1997). Iodine deficiency is associated with stillbirths and fetal wastage. It causes impaired cognitive function in children, who, as adults, will have limited productivity. Even subclinical deficiencies have adverse effects.

Many developing countries have large geographic areas where there is a high risk of iodine deficiency. It is caused by a deficiency of iodine in the soil, which results in low levels of iodine in locally grown foods (WHO/UNICEF/ICCIDD 1993). Salt iodization is one of the lowest-cost nutrition interventions, and universal iodization is currently under way. Communities need to become aware of the importance of monitoring salt supplies and consuming only iodized salt. Increased consumption of iodine through salt has resulted in a significant reduction in iodine deficiency disorders in Africa, Asia, and Latin America (ICCIDD 1996a, 1996b, 1997).

Integrating nutrition interventions with other health programs

The combined impact of nutrition and other health interventions is greater and longer lasting than either one alone. This is because malnutrition can make infants and children more susceptible to common infectious diseases and can increase the risk of death from these diseases (Pelletier et al. 1995). In addition, children who become sick are more likely to become malnourished for a number of reasons, including anorexia, increased catabolism of fats and protein, and increased loss or decreased absorption of nutrients. Strategies for reducing malnutrition must, therefore, be linked with approaches for managing the other important causes of morbidity and mortality in infants and children. Most important, nutrition interventions must be integrated into maternal and child health programs at the household, community, and health facility levels.

Integrating nutrition interventions to change household behaviors

In the home, a number of simple strategies have been shown to prevent infant and childhood illness and malnutrition, including breastfeeding, appropriate complementary feeding practices, obtaining enough micronutrients, basic hygiene practices (e.g., hand washing), and seeking a complete course of vaccines for infants in their first year of life. In addition, when a child becomes sick, caretakers must feed the child appropriately during and after the illness and seek care when it is required. An integrated package of preventive interventions to reduce malnutrition needs to focus on strengthening the mothers' and families' capacity in these areas (see Murray et al. 1997). Community health worker training programs should teach the importance of using all contacts to deliver messages tailored to reinforce essential nutrition behaviors. A variety of channels can be used, such as community groups, places of worship, women's associations, growth monitoring sessions, theater, traditional healers, and vendors of drug supplies, to transmit messages on the essential nutrition behaviors. Community-based women's support groups have been used to conduct counseling in conjunction with the Baby Friendly Hospital Initiative

(BFHI). The Hearth model has been successfully used to encourage teaching of nutrition by community members who themselves have good nutrition practices (Wollinka et al. 1997). The increased use of iodized salt has been promoted by nongovernmental organizations (NGOs), the United Nations Children's Fund (UNICEF), and other groups by teaching schoolchildren to change the nutrition practices of their families. In several countries, immunization contacts have been used to reach 80 to 90 percent coverage with vitamin A supplementation (UNICEF 1995b, 1996).

Integrating nutrition interventions to improve support for the community

A number of factors can influence nutrition in communities, including food prices or availability, infrastructure, economic and social stability, and the availability of private sector supplies of iron or iodized salt. Some of these factors need to be addressed at the national and policy levels, while others require local community action. Nutrition program planners and managers need to identify where gaps exist in these community supports. Sometimes changes can be stimulated by highlighting problems to policymakers and decisionmakers. Changes in policy can improve the availability of micronutrients and fortified foods through private sector suppliers, for example. The production and distribution of iodized salt or the fortification of foods with vitamin A can be facilitated by working with private producers. Other sectors (e.g., education, agriculture) can be important allies for health workers by reinforcing key nutrition messages.

Integrating nutrition interventions at health facilities

Health workers can promote essential nutrition behaviors by assessing feeding practices and counseling on proper feeding, encouraging the appropriate feeding of sick children both during and after illness, and distributing or promoting micronutrients (vitamin A, iron, and iodized salt). Outreach programs allow trained health workers to have contact with surrounding communities. A number of initiatives to improve health worker performance have been developed that integrate nutrition practices into more comprehensive packages. These include IMCI developed by WHO and UNICEF for training first-level health workers; the BFHI for improving feeding practices for infants and young children; vitamin A distribution at routine immunization sessions through the Expanded Program on Immunization (EPI) and during national immunization days; and distribution of iron/folate supplements in the safe motherhood initiative, which is designed to train traditional birth attendants and other staff to provide antenatal care (ANC). In some countries, interventions designed to improve the supply and delivery of essential drugs have included vitamin A capsules and iron tablets.

Programmatic elements of the Minimum Package

The Minimum Package is not a vertical or free-standing program. Each action needs to fit into other maternal and child health program activities. The program elements will need to include—

- updating and disseminating policies and technical guidelines;
- incorporating Minimum Package components into training objectives, plans, and materials;

- incorporating key nutrition components into supervisory tools and systems, and ensuring their use;
- identifying indicators and methods for measuring these indicators for program monitoring and evaluation;
- including nutrition-specific items in reviews of the logistics and supplies system; and
- incorporating the Minimum Package in IEC and community mobilization strategies.

Implementation of the Minimum Package

The Minimum Package needs to be adapted to local epidemiological, cultural, ethnic, and administrative conditions. There is an increasing emphasis on the development of decentralized programs that use local data to develop programs tailored to the local circumstances (Bhattacharyya and Murray 1997). A critical part of this process is the building of local capacity to carry out program development routinely. In most settings, three main steps are involved.

Step 1. Adaptation of interventions to local circumstances

The following elements should be reviewed to design interventions that address priority problems:

- *Existing data on prevalence of malnutrition and micronutrient deficiency disorders, maternal and child health program performance at the health facility and community levels, and measures of health worker performance and quality of services.* These data can help communities and program managers decide whether interventions need to be focused on specific areas and can help identify which interventions are likely to be the most important.
- *National and subnational policies and guidelines on nutrition interventions.* For example, whether EPI outreach workers are allowed to distribute vitamin A and whether there is a clear national policy on the duration of exclusive breastfeeding should be reviewed. Absence of national policies and guidelines can limit the development of new strategies at lower levels.
- *The current health facility practices for delivering antenatal, well-baby, and sick child care, including counseling.* This information can help identify where specific nutrition activities can be integrated into existing programs.
- *The current status of community structures and preferences for delivering services and health education.* This information can help identify where nutrition-specific activities and messages can be linked with existing programs, using existing staff and community groups. Many program activities must be tailored to the existing structures and systems, reflect the preferences of communities and caretakers, and increase the capacity of the personnel involved to implement Minimum Package activities on their own.
- *Role of NGOs and private sector.* A review of the role of the private sector, including NGOs, in the provision of health services and supplies can help identify how much of a role the private sector can play in program implementation.

An example of an adaptation of the Minimum Package interventions is outlined in the sidebar “Adapting Minimum Package Interventions: Zambia Example.”

Adapting Minimum Package Interventions: Zambia Example

UNICEF, World Bank, WHO, and USAID (BASICS) work at the national level to support health sector reforms in Zambia. The six primary nutrition behaviors and related interventions were reviewed by the Central Board of Health (CBOH), National Food and Nutrition Commission, UNICEF, and others at meetings in Lusaka. They modified the Minimum Package to fit the concerns and capabilities of Zambia, as shown below. In February 1997, the CBOH adopted the nutrition Minimum Package as Nutrition Components of Health and integrated it within the National Action Plan.

Breastfeeding

The Baby Friendly Hospital Initiative (BFHI) had developed national breastfeeding policies, guidelines for maternities, and training courses for medical specialists and physicians. A number of possible areas for improvement were identified: not all facilities had received training; there was no strategy in place in the certified facilities to sustain correct practices; community outreach was not well established; and a health education plan and materials were required. In addition, it was recognized that community education and outreach by formula marketing companies needed to be better monitored and regulated.

Complementary feeding

Formative research had been conducted to permit development of national guidelines on complementary feeding. A plan to improve complementary feeding practices included adding training on complementary feeding to the BFHI training courses, developing training guidelines for conducting complementary feeding counseling with monthly weighings at health centers, and including complementary feeding messages with other child health education messages and strategies.

Vitamin A

Central vitamin A capsule supplies were adequate for the country, but distribution to districts and health centers did not occur systematically and vitamin A protocols were not followed. The fortification of sugar with vitamin A was considered as a possible complement to vitamin A capsule distribution and was highlighted for further investigation. The use of vitamin A–fortified sugar could reduce the need for nationwide capsule distribution within two years.

Case management

Case management of childhood diseases using vitamin A was already a policy, and training using the integrated management of childhood illness (IMCI) protocol was planned. It was recognized that more attention needed to be focused on management of severely malnourished cases.

Iron/folate

Provision of prenatal iron/folate was considered an important but neglected priority. A situation analysis of the ANC program and formative research on compliance with protocols during pregnancy were identified as next steps.

Iodized salt

Use of iodized salt is a national policy, and supplies were available in most parts of the country. The primary focus for program activities was to develop messages and strategies regarding the consumption of iodized salt in communities and households.

Step 2. Choice of delivery systems, messages, and strategies appropriate for the local context

An understanding of existing caretaker, household, community, and health worker behaviors/practices and motivations is essential to ensure that high coverage, quality, and impacts are achieved. Where possible, existing quantitative and qualitative data should be used. Formative research and situational analyses are useful tools. A range of tools for assessing and designing nutrition strategies now exists to make this task easier (examples include Dickin, Griffiths, and Piwoz, *Designing by Dialogue*, 1996; BASICS, *A Tool Box for Building Health Communication Capacity*, 1996; and BASICS, *Nutrition Minimum Package Needs Assessment*, forthcoming). There is increasing emphasis on the use of integrated local planning methods to develop community- and facility-based maternal and child health programs. These approaches include an assessment of essential nutrition behaviors and emphasize the development of strategies by frontline health staff as well as communities themselves. If possible, it is considerably more cost-effective to collect all essential information at the same time using this type of methodology (examples include Murray and Manoncourt, *Integrated Health Facility Assessment*, 1997; and Bhattacharyya and Murray, *Community Assessment and Planning for Maternal and Child Health Programs*, 1997).

As discussed above, Minimum Package interventions may be implemented through a number of channels, including ANC clinics, maternities, growth monitoring sessions, well-baby clinics, EPI services, IMCI, community outreach from health facilities, community-based providers, and other community-based groups and individuals. Since the Minimum Package interventions require expertise similar to that of other social or development programs, they are often easy to integrate with other non-health sector activities. Training and support provided to agricultural extension workers, teachers, and religious institutions have worked well. Coordination with other sectors can help minimize the demands on health workers.

Action plans for strengthening the Minimum Package component of primary health care programs need to identify how, when, and by whom responsibility for critical steps will be taken. A number of implementation strategies have been used, including incorporating policy options in an overall set of policy dialogue issues for the World Bank, UNICEF, and/or U.S. Agency for International Development (USAID) Missions; adding a module on prenatal iron supplements, postpartum vitamin A, and breastfeeding preparation/initiation to pre- and in-service training courses for nurse midwives; adding sufficient vitamin A and iron supplements to Essential Drugs Kits; training EPI teams to distribute vitamin A; and promoting adequate complementary feeding through BFHI training.

Step 3. Development and implementation of a monitoring and evaluation plan

A monitoring and evaluation plan is critical for determining whether Minimum Package interventions that are targeted at changing caretaker practices have been effective. Measuring changes in nutrition behaviors in households may be the only practical way to monitor progress toward improving child health and nutrition because impact (reductions in mortality and morbidity) often can only be demonstrated over a period of several years using large-scale surveys. By assuming that improved caretaker practices will have an impact on infant and child morbidity and mortality, we can demonstrate child survival program effectiveness using simple and rapid techniques. Regular monitoring of program performance can be used to change or improve interventions that may not be working. The target behaviors selected by community programs can form the basis for simple program objectives and indicators. For example, a program focusing on improving complementary feeding practices in a particular setting might define a program objective and indicator as follows:

- Objective: 75 percent of children aged 12–23 months receive appropriate complementary feeding in addition to breastfeeding
- Indicator: Proportion of children aged 12–23 months who receive breast milk at least four times in 24 hours and who are fed recommended complementary foods at least four times a day

The most common method used to measure changes in caretaker knowledge and practice is a household survey, in which a structured interview is administered to a random sample of the population targeted by the program. This approach attempts to measure the proportion of the caretaker population that is practicing each focus behavior. Baseline and follow-up surveys can be administered in communities to measure changes in key indicators over time. In addition, surveys can be conducted in communities not targeted by the program, to compare their health behaviors to the health behaviors of those who participated in program activities. Differences between baseline and follow-up results will reveal whether caretakers have changed their behaviors and objectives have been met. Evaluation results can also help determine how to develop and focus interventions to maximize program effectiveness. There is an increasing emphasis on the development of rapid, simple, participatory survey methods that can be used in communities by local health staff to monitor programs using local resources.

In addition to measuring nutrition behaviors at the household level, other program elements can be measured at both the health facility and higher levels to track whether planned program tasks are being conducted. Examples of indicators that have been used to track Minimum Package interventions are shown in table 1. These indicators are illustrative; indicators must be matched to the specific objectives of each program.

Table 1.
Indicators for
Monitoring
the Minimum
Package

Population Level

- Proportion of infants 0–4 months exclusively breastfeeding. (Note: Infants 0–4 months is the most frequently used age grouping since very few infants are exclusively breastfed up to 6 months, which is the desired policy.)
- Proportion of infants 6–11 months receiving appropriate complementary feeding in addition to breastfeeding (according to locally determined recommendations)
- Proportion of infants 12–23 months receiving appropriate complementary feeding in addition to breastfeeding (according to locally determined recommendations)
- Proportion of children 6–71 months who received at least two vitamin A capsules within the past 12 months
- Proportion of women who took the recommended number of iron/folate tablets during their last pregnancy
- Proportion of households using iodized salt
- Proportion of children who consumed recommended foods and fluids during their last illness
- Proportion of children who increased intake of the recommended foods for at least five days following their last illness

Health Facility Level

- Proportion of health workers trained in Minimum Package assessment and counseling skills in the previous 12 months
- Proportion of sick and malnourished children who are screened and managed appropriately for feeding and nutrition
- Proportion of well children <2 years who receive a nutritional assessment and counseling according to Minimum Package protocols
- Proportion of pregnant women who receive iron/folate tablets and breastfeeding counseling according to protocols
- Proportion of facilities that have received at least one supervisory visit in the previous six months (using an integrated checklist that includes Minimum Package assessment and counseling)

Program Level

- Proportion of first-level health facilities providing an integrated package of maternal and child health services that includes the Minimum Package for sick children, well children, and reproductive health
- Proportion of hospitals and maternity units following “baby friendly” criteria of the BFHI
- Number of essential nutrition policies and guidelines updated, completed, and adopted by the Ministry of Health
- Proportion of health districts conducting regular planning for Minimum Package implementation as part of their planning for primary health care activities
- Proportion of surveys and service quality assessments that include Minimum Package indicators

Conclusion

The nutrition Minimum Package interventions target the six primary nutrition behaviors that have been shown to reduce infant and child morbidity and mortality in the developing world. There are now many promising strategies available for integrating these nutrition interventions with other primary health care programs. To obtain the best results, health managers need detailed information on current internationally recommended protocols, combined with lessons learned regarding training, supervision, supplies and logistics, monitoring and evaluation, and IEC/behavior change strategies. Some of this information will be provided in *Nutrition Essentials*, a handbook currently being prepared by BASICS. This guide will collate, simplify, and make accessible information on technical program management aspects of nutrition activities. In the interim, existing information on breastfeeding, complementary feeding, and micronutrients can be obtained from WHO and UNICEF, or by contacting BASICS or other USAID projects such as OMNI (micronutrients), LINKAGES (breastfeeding, lactation amenorrhea method, complementary feeding, and maternal nutrition), and MotherCare (maternal health and nutrition).

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